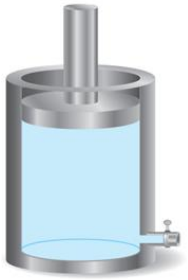
Chemistry
Ticket Out the Door
Set 34: Ideal Gas Law

Name _____ Period _____

Skill 34.01 Problem 1

Gas is confined to the cylinder shown below,



▲ **Figure 9.10 Cylinder with piston and gas inlet valve.**

If additional gas is injected into the cylinder through the gas inlet valve, indicate how this change affects the

(a) average distance between the molecules

(b) the average energy of the molecules

(c) the pressure of the gas

(d) the number of moles of gas in the cylinder

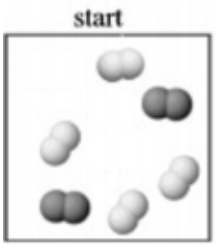
Name _____ Period _____

Skill 34.01 Problem 2

The picture shows hydrogen (light) and oxygen (dark) molecules at the start of a reaction. The container in which the molecules are confined is flexible. The molecules react to form water. At the "start" of the reaction, the volume of the reactant mixture is 6.0 L.

(a) What is the volume of the products at the "finish" of the reaction?

(b) Draw a picture that represents the reaction mixture and at the "finish" of the reaction.



Skill 34.01 Problem 3

(a) According to figure 2, what does one mole of gas occupy at STP? (Molar volume)

(b) A chemical reaction is expected to produce 0.0680 mol of oxygen gas. What volume in liters will be occupied by this gas sample at STP?

(c) What is the mass in grams occupied by 11.2 L of oxygen gas (O_2)?

(d) What volume in liters is occupied by 14.0 g of nitrogen gas (N_2)?

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Skill 34.02 Problem 1

Potassium chlorate decomposes upon heated according to the following equation,

$2KClO_3 \rightarrow KCl + 3O_2$

A student conducted an experiment and recorded the data shown below,

Mass $KClO_3$ (g)	5.0
Mass KCl recovered (g)	1.7
Temp water (^oC)	23
Volume O_2 (mL)	2500
Pressure (atm)	1.0

What is R, the ideal gas constant?

Skill 34.03 Problem 1

What is the volume in liters of 1.00 mol of N_2 gas at a STP. (Recall STP stands for Standard Temperature and Pressure. That is where P = 1 atm and T = 273 K)

Skill 34.03 Problem 2

What is the pressure of 8.00 g of oxygen gas (O_2) when the pressure is 758 mm Hg and the temperature is 25^{o}C?

Name _____ Period _____